

Changes in self-esteem and quality of life
following CoPs or CBIT therapies
in youth with tics –

Do tic-specific traits influence
psychosocial outcomes?

Presented by:

Julie Leclerc (MPs, PhD) & Ilana Singer (MSc, PhD candidate)

Co-authors: Lavoie, M.E., Gauthier, B., Woods, D.W., O'Connor, K.P.

DISCLOSURES

FUNDING

Canadian Institutes of Health Research (CIHR; grant #142260); Fonds de recherche du Québec – Société et Culture (FRQ-SC; team grant #270517)

CONFLICTS OF INTEREST

None to declare.

Authors of CoPs/CBIT approach: O'Connor, Woods, Leclerc

ACKNOWLEDGEMENTS

We thank the therapists, evaluators, and research assistants.

We are deeply grateful to the participants and their families.

INTRODUCTION

TICS WAX & WANE

- Tics fluctuate.
- Context shapes tic expression.
- Individual patterns of high- and low-risk tic situations.

(APA, 2022; Conolea et Woods, 2008; Gill & Kompoliti, 2020; O'Connor et al., 2017)

PHYSIOLOGICAL FEATURES

- Premonitory sensations.
- Increased muscular tension and attention.
- Need for symmetry or just-right feeling.

(Brandt et al., 2023 ; Johnson et al., 2023; Gill et Kompoliti, 2020; Rajagopal et al., 2013)

COGNITIVE- BEHAVIORAL THERAPIES

- Guidelines recommend CBT as first-line treatment.
- 25-30% continue to experience impairing tics after treatment.
- Need to target underlying mechanisms.

(Cavanna et al., 2013; Espil et al., 2022; Pringsheim et al.2019, Wilhelm et al., 2012)

COGNITIVE-PSYCHOPHYSIOLOGICAL (CoPs)

- Addresses the cognitive, behavioral, psychophysiological dimensions of tics, emphasizing the interaction between these processes.
 - Sensorimotor hypersensitivity
 - Muscle contraction
 - Over-reactivity
- Strong evidence for efficacy in youth & adults. Comparable to CBIT.
- Extensive theoretical & empirical support.

Chronologically:

O'Connor et al., 2001;
O'Connor, 2002;
O'Connor, 2005;
O'Connor et al., 2005;
O'Connor et al., 2009;
Thibault et al., 2009;
Bellavance, 2010;
Lavoie et al., 2011;
Lavoie et al., 2013;
O'Connor et al., 2014;
Morand-Beaulieu et al., 2015;
O'Connor et al., 2015;
Lavoie et al., 2016;
Leclerc et al., 2016a;
Leclerc et al., 2016b;
O'Connor et al., 2016;
Pabst et al., 2020;
Leclerc et al., 2024
Mazur-Lainé et al., 2024;
Soubata et al., 2026;
Leclerc et al., (submitted)

PSYCHOSOCIAL CHALLENGES

- Embarrassment, avoidance, reduced activity participation
- ↓ **quality of life**

UNPREDICTABILITY

- Influences self-image and self-worth
- ↓ **self-esteem**

ATTENTIONAL BIASES

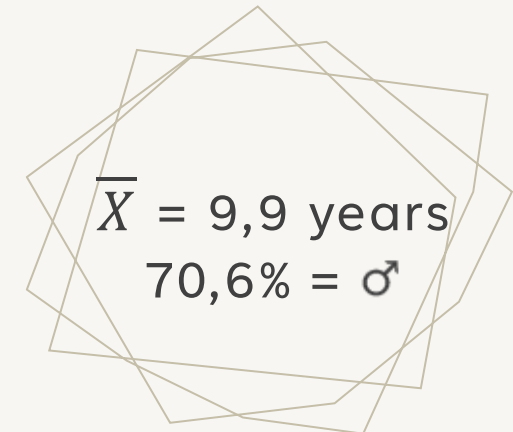
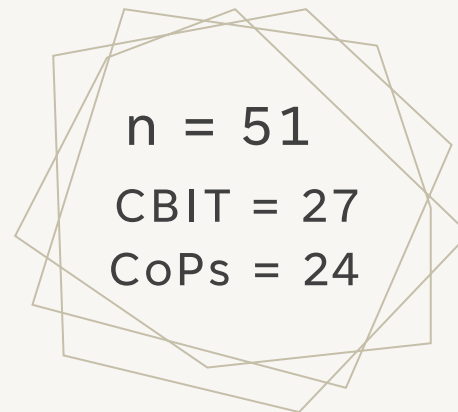
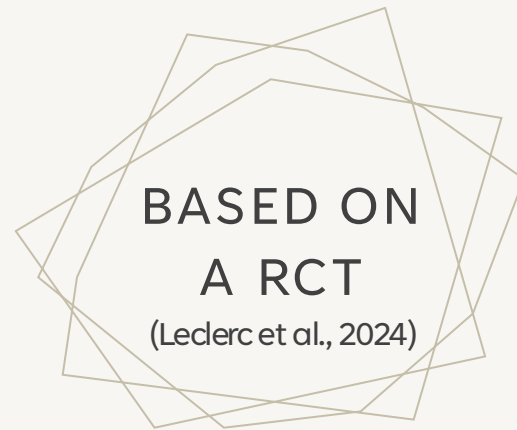
- Social environments
- Perceived threats

TIC-SPECIFIC COGNITIVE TRAITS

- Action planning styles
- Impulsive perfectionism
- Negative self-evaluation, unrealistic expectations and dissatisfaction

This study examined the effects of CBIT and CoPs on quality of life and self-esteem.

A secondary objective was to investigate whether tic-specific traits (action planning styles and impulsive perfectionism) predict post-treatment changes in these outcomes.



OBJECTIVES & METHODS

RESULTS

Table 2. One-Way ANCOVA of Intervention Effects

Variable	Post-Treatment to Baseline					Follow-Up to Baseline				
	M (SE)		F	p	η^2_p	M (SE)		F	p	η^2_p
	CBIT	CoPs				CBIT	CoPs			
Quality of Life (GTS-QoL; Cavanna et al., 2013; J-Nolin & Leclerc, 2021)										
Total	-7.87 (1.95)	-4.34 (1.95)	1.62	0.21	0.04	-9.81 (2.90)	-6.05 (3.11)	0.74	0.40	0.03
Psychological	-8.12 (2.11)	-3.30 (2.16)	2.47	0.12	0.06	-9.91 (3.78)	-5.60 (4.05)	0.59	0.50	0.03
Physical	-7.84 (2.31)	-4.48 (2.36)	0.99	0.33	0.02	-11.81 (2.76)	-6.41 (2.96)	1.70	0.21	0.07
Obs./Comp.	-6.93 (3.01)	-5.49 (3.08)	0.11	0.74	0.003	-8.08 (3.33)	-3.98 (3.58)	0.66	0.43	0.03
Cognitive	-6.56 (2.65)	-2.28 (2.70)	1.23	0.27	0.03	-8.35 (3.50)	-9.21 (3.77)	0.03	0.88	0.001
Self-Esteem (CFSEI-II; Battle, 1992)										
Total	-1.16 (.36)	-0.12 (.38)	3.91	0.05*	0.10	-1.20 (.47)	-1.20 (.58)	0.00	0.10	0.99
General	-0.78 (.21)	-0.44 (.22)	1.27	0.27	0.03	-0.73 (.29)	-0.81 (.36)	0.03	0.86	0.002
Parent	-0.02 (.07)	-0.02 (.08)	0.11	0.74	0.003	0.20 (.10)	-0.10 (.13)	3.17	0.09	0.15
Academic	-0.19 (.15)	-0.03 (.16)	0.59	0.45	0.02	-0.31 (.14)	-0.24 (.17)	0.11	0.75	0.01
Social	-0.03 (.15)	-0.02 (.16)	0.002	0.97	0.00	-0.18 (.20)	-0.33 (.24)	0.23	0.64	0.01

* $p < .05$

RESULTS

Table 3. Multiple Regression Models Predicting Change in Quality of Life and Self-Esteem

	Post-Treatment to Baseline				Follow-Up to Baseline			
	B	SE	t	p	B	SE	t	p
STOP (<i>O'Connor, 2002</i>)								
Total	0.61	1.73	0.36	0.72	0.66	3.44	0.19	0.85
Over-Preparedness	1.20	0.95	1.26	0.22	0.83	1.15	0.73	0.48
Inflexibility	0.66	0.97	0.68	0.50	0.10	1.88	0.05	0.96
Over-Anticipation	-0.15	0.61	-0.25	0.80	0.04	1.33	0.03	0.98
Over-Activity	-0.44	0.36	-1.25	0.22	-0.27	0.58	-0.46	0.65
Perfectionism (<i>A/M-PS; Rice & Preusser, 2002</i>)								
Total	-0.40	1.15	-0.35	0.73	-1.65	1.57	-1.05	0.31
Sensitivity to Errors	-0.46	0.51	-0.90	0.38	-0.42	0.40	-1.04	0.31
Contingent Self-Esteem	0.05	0.34	0.14	0.89	0.55	0.49	1.11	0.28
Compulsivity	0.53	0.47	1.13	0.27	-1.07	0.63	-1.70	0.10
Need for admiration	-0.50	0.39	-1.30	0.20	-0.53	0.53	-1.01	0.32

DISCUSSION

- CBIT & CoPs led to comparable improvements in quality of life.
- A transient improvement in self-esteem was observed following CBIT (not maintained at follow-up).
- Tic-specific traits did not predict psychosocial changes.

LIMITS

Sample size

Attrition

FUTURE RESEARCH

Mediators

Therapeutic components

CONCLUSION

- Quality of life and self-esteem appear to be shaped by processes beyond tic reduction.
- This study highlights the need to complement symptom-focused treatments with approaches targeting positive mental health and self-esteem.
- Develop a diverse range of evidence-based psychotherapies for tics.



THANK YOU!

leclerc.julie@uqam.ca

www.letope.uqam.ca

Current RCT comparing CoPs alone vs combined with biofeedback... Results still pending!



REFERENCES

- American Psychiatric Association [APA]. (2022). *Diagnostic and statistical manual of mental disorders DSM-5-TR* (5-TR ed.).
- Bellavance, J. (2010). Évaluation des effets d'un programme d'entraînement à l'autogestion des tics sur le fonctionnement social d'adolescents atteints du syndrome de Gilles de la Tourette. <http://www.svs.ulaval.ca/index.php?pid=651etall=1etid=3888>.
- Brandt, V., Essing, J., Jakubovski, E., & Müller-Vahl, K. (2023). Premonitory Urge and Tic Severity, Comorbidities, and Quality of Life in Chronic Tic Disorders. *Movement Disorders Clinical Practice*, 10(6), 922–932. <https://doi.org/10.1002/mdc3.13742>
- Buse, J., Kirschbaum, C., Leckman, J. F., Münchau, A., & Roessner, V. (2014). The Modulating Role of Stress in the Onset and Course of Tourette's Syndrome: A Review. *Behavior Modification*, 38(2), 184–216. <https://doi.org/10.1177/0145445514522056>
- Cavanna, A. E., David, K., Bandera, V., Termine, C., Balottin, U., Schrag, A., & Selai, C. (2013). Health-Related Quality of Life in Gilles de la Tourette Syndrome: A Decade of Research. *Behavioural Neurology*, 27(1), 83–93. <https://doi.org/10.1155/2013/732038>
- Conelea, C., Woods, D., Zinner, S., Budman, C., Murphy, T., Scahill, L. et Walkup, J. (2011). Exploring the Impact of Chronic Tic Disorders on Youth: Results from the Tourette Syndrome Impact Survey. *Child Psychiatry & Human Development*, 42(2), 219–242. doi:10.1007/s10578-010-0211-4
- Conelea, C. A., & Woods, D. W. (2008). The influence of contextual factors on tic expression in Tourette's syndrome: A review. *Journal of Psychosomatic Research*, 65(5), 487–496. <https://doi.org/10.1016/j.jpsychores.2008.04.010>
- Cox, J. H., Nahar, A., Termine, C., Agosti, M., Balottin, U., Seri, S., & Cavanna, A. E. (2019). Social stigma and self-perception in adolescents with tourette syndrome. *Adolescent Health, Medicine and Therapeutics*, Volume 10, 75–82. <https://doi.org/10.2147/AHMT.S175765>
- Espil, F. M., Woods, D. W., Specht, M. W., Bennett, S. M., Walkup, J. T., Ricketts, E. J., McGuire, J. F., Stiede, J. T., Schild, J. S., Chang, S. W., Peterson, A. L., Scahill, L., Wilhelm, S., & Piacentini, J. C. (2022). Long-term Outcomes of Behavior Therapy for Youth With Tourette Disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 61(6), 764–771. <https://doi.org/10.1016/j.jaac.2021.08.022>
- Gill, C. E., & Kompoliti, K. (2020). Clinical features of Tourette syndrome. *Journal of Child Neurology*, 35(2), 166–174. <https://doi.org/10.1177/0883073819877335>
- Huisman-van Dijk, H. M., Matthijssen, S. J. M. A., Stockmann, R. T. S., Fritz, A. V., & Cath, D. C. (2019). Effects of comorbidity on Tourette's tic severity and quality of life. *Acta Neurologica Scandinavica*, 140(6), 430–439. <https://doi.org/10.1111/ane.13155>
- J-Nolin, G., Leclerc, J. (2021). La qualité de vie d'enfants avec le syndrome de Gilles de la Tourette (The quality of life of children with Tourette disorder). *Revue québécoise de psychologie*, 42(1), 171–194.
- Johnson, K. A., et al. (2023). Tourette syndrome: clinical features, pathophysiology, and treatment. *The Lancet Neurology*, 22(2), 111–125. [https://doi.org/10.1016/S1474-4422\(22\)00303-9](https://doi.org/10.1016/S1474-4422(22)00303-9)
- Lavoie, M. E., Imbriglio, T. V., Stip, E., & O'Connor, K. P. (2011). Neurocognitive changes following cognitive-behavioral treatment in Tourette syndrome and chronic tic disorder. *International Journal of Cognitive Therapy*, 4(1), 34–50. <https://doi.org/10.1521/ijct.2011.4.1.34>
- Lavoie, M. E., Leclerc, J., & O'Connor, K. P. (2013). Bridging neuroscience and clinical psychology: Cognitive-behavioral and psychophysiological models in the evaluation and treatment of Gilles de la Tourette syndrome. *Neuropsychiatry*, 3(1), 75–87. <https://doi.org/10.2217/np.12.70>
- Lavoie, M. E., O'Connor, K. P., **Leclerc, J. B.**, Blanchet, P. J., Morand-Beaulieu, S. (2016). ERP and motor changes following therapy in the Gilles de la Tourette Syndrome. *International Journal of Psychophysiology*, 108, 59–60. doi : 10.1016/j.ijpsycho. 2016.07.197

- Leclerc, J.B., Singer, I., Lavoie, M.E., Gauthier, G., Woods, D.W., Blanchet, P.J., O'Connor, K.P. (submitted). Self-Esteem and Quality of Life Following CBIT or CoPs Therapies in Youth with Tics and the Role of Tic-Specific Traits: A Secondary Analysis of a Randomized Controlled Trial. *Journal of Child Psychology and Psychiatry*.
- Leclerc, J. B., O'Connor, K. P., Valois, P., Lavoie, M. E. (2016a). The effect of a new therapy for children with tics targeting underlying cognitive, behavioral and physiological processes. *Frontiers in Psychiatry*, 7(135). doi : 10.3389/fpsyt.2016.00135
- Leclerc, J. B., Valois, P., Gabrielle, J., Bombardier, M., Ouellette, S., O'Connor, K. P. (2016b). A Therapy for Tics in Children Managing Underlying Processes: a Pilot Study. *Journal of Developmental and Physical Disabilities*, 28, 581-593. doi : 10.1007/s10882-016-9496-y
- Leclerc, J. B., O'Connor, K. P., Gauthier, B., Singer, I., Woods, D. W., Blanchet, P., & Lavoie, M. E. (2024). Comparison of cognitive-behavioral treatments for tics and Tourette syndrome in youth and adults: A randomized controlled trial. *Journal of Behavioral and Cognitive Therapy*, 100491. <https://doi.org/10.1016/j.jbct.2024.100491>
- Mazur-Lainé, E., Soubata, H., Leclerc, J. B., Blanchet, P. J., O'Connor, K.P., Lavoie, M.E. (2024). Impacts of ADHD symptomatology on the response to cognitive-behavioural therapy with Gilles de la Tourette Syndrome patients. *Journal of Clinical Medicine*, 13(10), 2975. <https://doi.org/10.3390/jcm13102975>
- Morand-Beaulieu, S., O'Connor, K. P., Sauvé, G., Blanchet, P. J., & Lavoie, M. E. (2015). Cognitive-behavioral therapy induces sensorimotor and specific electrocortical changes in chronic tic and Tourette's disorder. *Neuropsychologia*, 79, 310-321. <https://doi.org/10.1016/j.neuropsychologia.2015.05.024>
- O'Connor, K. P. (2002). A cognitive-behavioral/psychophysiological model of tic disorders. *Behaviour Research and Therapy*, 40(10), 1113-1142. [https://doi.org/10.1016/S0005-7967\(02\)00048-7](https://doi.org/10.1016/S0005-7967(02)00048-7)
- O'Connor, K. (2005). *Cognitive-Behavioral Management of Tic Disorders* (1st ed.). Wiley. <https://doi.org/10.1002/9780470713518>
- O'Connor, K. P., Lavoie, M. E., Robert, M., Stip, E., & Borgeat, F. (2005). Brain-behavior relations during motor processing in chronic tic and habit disorder. *Cognitive and Behavioral Neurology*, 18(2), 79-88. <https://doi.org/10.1097/01.wnq.0000151131.06699.af>
- O'Connor, K. P., Laverdure, A., Taillon, A., Stip, E., Borgeat, F., & Lavoie, M. E. (2009). Cognitive behavioral management of Tourette's syndrome and chronic tic disorder in medicated and unmedicated samples. *Behaviour Research and Therapy*, 47(12), 1090-1095. <https://doi.org/10.1016/j.brat.2009.07.021>
- O'Connor, K., St-Pierre-Delorme, M.-È., Leclerc, J. B., Lavoie, M., Blais, M.T. (2014). Meta-cognitions in Tourette syndrome, tic disorders, and body-focused repetitive disorder. *The Canadian Journal of Psychiatry*, 59(8), 417-425. doi: 10.1177/070674371405900804
- O'Connor, K. P., Lavoie, M. E., Blanchet, P. J., & St-Pierre-Delorme, M.-È. (2016). Evaluation of a cognitive psychophysiological model for management of tic disorders: an open trial. *The British Journal of Psychiatry*, 209(1), 76-83. <https://doi.org/10.1192/bjp.bp.114.154518>
- O'Connor, K. P., Lavoie, M. E., & Schoendorff, B. (2017). *Managing tic and habit disorders: A cognitive psychophysiological treatment approach with acceptance strategies*. Wiley-Blackwell.
- Pile, V., Lau, J. Y. F., Topor, M., Hedderly, T., & Mataix-Cols, D. (2019). Interoceptive accuracy in youth with tic disorders: Exploring links with premonitory urge, anxiety and quality of life. *Journal of Autism and Developmental Disorders*, 49(10), 4206-4216. <https://doi.org/10.1007/s10803-018-3608-8>
- Pringsheim, T., Okun, M. S., Müller-Vahl, K., Martino, D., Jankovic, J., Cavanna, A. E., Woods, D. W., Robinson, M., Jarvie, E., Roessner, V., Oskoui, M., Holler-Managan, Y., & Piacentini, J. (2019). Practice guideline recommendations summary: Treatment of tics in people with Tourette syndrome and chronic tic disorders. *Neurology*, 92(19), 896-906. <https://doi.org/10.1212/WNL.0000000000007466>
- Quast, L. F., Rosenthal, L. D., Cushman, G. K., Gutiérrez-Colina, A. M., Braley, E. I., Kardon, P., & Blount, R. L. (2020). Relations Between Tic Severity, Emotion Regulation, and Social Outcomes in Youth with Tourette Syndrome. *Child Psychiatry & Human Development*, 51(3), 366-376. <https://doi.org/10.1007/s10578-019-00948-8>
- Rajagopal, S., Seri, S., & Cavanna, A. E. (2013). Premonitory urges and sensorimotor processing in Tourette syndrome. *Behavioural Neurology*, 27(1), 65-73. <https://doi.org/10.3233/BEN-120308>
- Rivera-Navarro, J., Cubo, E., & Almazán, J. (2014). The impact of Tourette's syndrome in the school and the family: Perspectives from three stakeholder groups. *International Journal of the Advancement of Counselling*, 36(1), 96-113. <https://doi.org/10.1007/s10447-013-9193-9>
- Thibault, G., O'Connor, K. P., Stip, E., & Lavoie, M. E. (2009). Electrophysiological manifestations of stimulus evaluation, response inhibition and motor processing in Tourette syndrome patients. *Psychiatry Research*, 167(3), 202-220. <https://doi.org/10.1016/j.psychres.2008.03.021>
- Wilhelm, S., Peterson, A. L., Piacentini, J., Woods, D. W., Deckersbach, T., Sukhodolsky, D. G., Chang, S., Liu, H., Dziura, J., Walkup, J. T., & Scahill, L. (2012). Randomized trial of behavior therapy for adults with Tourette syndrome. *Archives of General Psychiatry*, 69(8), 795-803. <https://doi.org/10.1001/archgenpsychiatry.2011.1528>

Figure 1. Consort Flow Chart

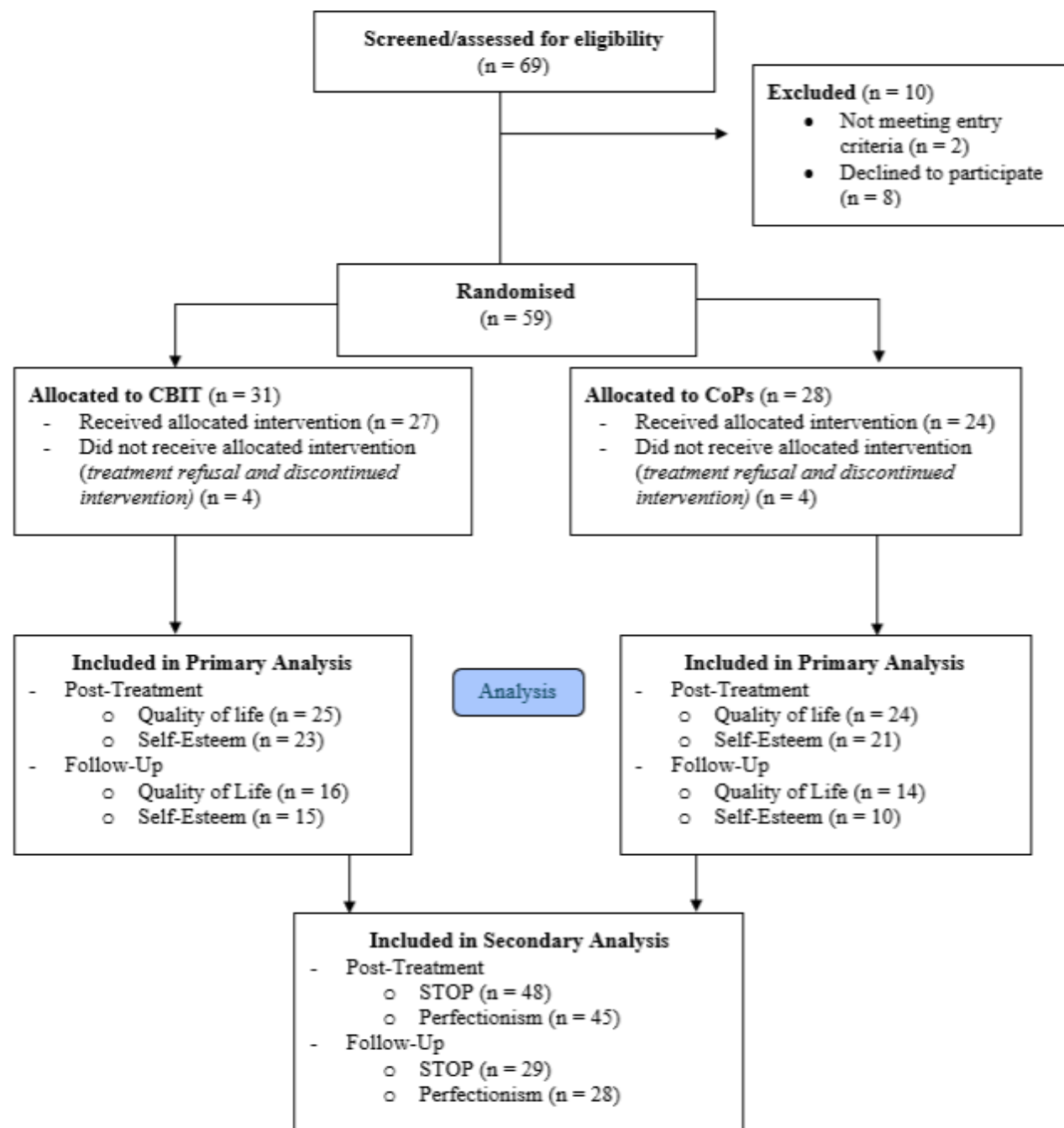


Table 1. Baseline characteristics by treatment group

Characteristic	CBIT (n = 27)	CoPs (n = 24)
Age, M (SD)	10.15 (1.77)	9.67 (1.61)
Sex, n (%)		
Male	17 (63.0)	19 (79.2)
Female	10 (37.0)	5 (20.8)
Co-occurring disorders ^a , n (%)	15 (55.6)	16 (66.7)
Learning Difficulties ^a , n (%)	7 (25.9)	7 (29.2)
Medication ^b , n (%)	15 (55.6)	13 (54.2)
Tics	7 (25.9)	6 (25.0)
Attention/Hyperactivity-Impulsivity	8 (29.6)	9 (37.5)
Anxiety	5 (18.5)	3 (12.5)
Sleep	3 (11.1)	5 (20.8)
Tic Severity (YGTSS), M (SD)	35.42 (15.10)	31.0 (14.02)
Psychological profiles (BYI-II), M (SD)		
Self-Concept	50.04 (7.37)	51.83 (7.58)
Anxiety	48.92 (10.55)	48.42 (8.02)
Depression	47.15 (10.25)	45.29 (6.70)
Anger	45.00 (9.13)	43.88 (9.47)
Disruptive Behavior	43.66 (7.16)	42.88 (6.16)

Abbreviations. CoPs = Cognitive Psychophysiological Treatment, CBIT = Comprehensive Behavioral Intervention for Tics, ADHD = Attention-deficit hyperactivity disorder, YGTSS = Yale Global Tic Severity Scale, BYI-II = Beck Youth Inventories

^aPresence of.

^bFor symptoms, not diagnosis.

Analyses

For the first objective (examining the effects of treatment modality (CBIT vs. CoPs) on participants' quality of life and self-esteem)

- **4 separate one-way analyses of covariance (ANCOVAs) were conducted (Table 2).**

Second objective (examining whether tic-specific traits predict changes in outcome scores)

- **we combined participants from both CBIT and CoPs into a single sample.**
- **A series of multiple linear regression models was performed (Table 3).**

Autism spectrum disorder was an exclusion criterion in this RCT to maintain sample homogeneity and reduce variability related to differences in cognitive and socio-communicative profiles that could influence treatment delivery and outcome assessment.

However, the intervention can be adapted for youth with ASD in clinical practice.